Abstract

Material Science

# INVESTINGATION OF THE SURFACE STRUCTURE OF INGAAS ALLOYS USING STM AND A COMPUTER AIDED SORTING ALGORITHM

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The atomic structure of alloy surfaces has a significant impact on various processes in thin film growth, including surface segregation, atomic ordering, and phase separation. In this study, we have examined the coverage of different types of surface reconstructions as a function of film thickness and annealing time using a Computer aided sorting algorithm of Scanning Tunneling Microscopy images. Images of ternary alloy surfaces are quite disordered, which necessitated the development of an algorithm to systematically categorize the symmetry of the surface reconstructions present. The sorting algorithm identifies the centroid of each feature, takes a Fast Fourier Transform, and finally determines the percent coverage of each observed symmetry. For the InGaAs alloys studied here, three surface reconstructions were observed: alpha2 (2x4), (4x3) or (Nx3). It was also shown that the percent coverage of each reconstruction depends on the growth conditions.